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A PROPOSAL TO
THE CORPORATION OF
THE CITY OF HAMILTON

FOR A STUDY OF
THE PERIMETER INDUSTRIAL ROAD

JUNE 1973

DE LEUW CATHER, CANADA LTD.
CONSULTING ENGINEERS AND PLANNERS _____

De Leuw, Cather

ENGINEERS AND PLANNERS

June 27, 1973

Mr. W.A. Wheten, B.Sc., F.E.I.C., P.Eng.
City Engineer and Manager of Water Works
The Corporation of the City of Hamilton
Department of Engineering
City Hall
Hamilton, Ontario, L8N 3T4

Attention: Mr. D.W. Roughley

Dear Mr. Wheten:

Re: Perimeter Industrial Road

We are attaching our proposal for this project.

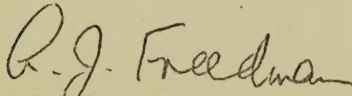
In essence the proposal describes a two-stage program of work. The first stage is designed to provide justification very quickly for the roadway from the standpoint of industry's needs and the overall impacts and effects of not building it. Stage I would take about fourteen weeks to complete at a cost of \$25,000 to \$28,000. It would include a public participation program. At the end of this period the decision can be made to continue into Stage II if the roadway is justified, or to terminate the project in the event it is not warranted or it is not acceptable to the public.

Stage II would consist of a detailed, comprehensive investigation of the feasible alternative alignments; an evaluation and comparison of these in terms of issues related to transportation engineering, and the natural and man-made environment; and selection of the recommended route. The public participation program would be continued. This stage would last about forty-six weeks and cost \$140,000 to \$143,000 in fees and expenses.

The total in estimated fees and expenses for Stages I and II is therefore about \$168,000; and if there were no break between stages the study would take in the order of fifteen months to complete.

We very much appreciate the invitation to prepare this proposal, and we look forward to presenting our study program to the City of Hamilton.

Yours very truly,


A. J. Freedman, Associate
Director, Planning & Environment Division

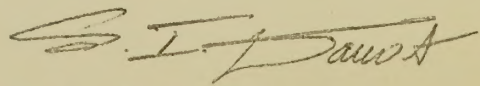

S. I. Donat, Associate
Chief Highway Planner

TABLE OF CONTENTS

	<u>PAGE</u>
SECTION 1 - INTRODUCTION & SUMMARY	1
SECTION 2 - PROPOSED WORK PROGRAM & STUDY SCHEDULE	5
Stage I - Need For The Route	5
Stage II - Route Identification & Selection	11
Study Schedule	15
SECTION 3 - PROJECT ORGANIZATION	19
SECTION 4 - ESTIMATED FEES & EXPENSES	22
APPENDIX 'A' - BACKGROUND OF THE TEAM MEMBERS	
APPENDIX 'B' - RESUMES OF KEY STAFF	
EXHIBIT 1 - THE MULTI-DISCIPLINARY TEAM	4
EXHIBIT 2A - PRELIMINARY SCHEDULE - STAGE I	17
EXHIBIT 2B - PRELIMINARY SCHEDULE - STAGE II	18
EXHIBIT 3 - PROJECT ORGANIZATION	21

SECTION 1 - INTRODUCTION & SUMMARY

INTRODUCTION

This document has been prepared by De Leuw Cather in response to the invitation received from the City Engineer dated May 2, 1973. The proposal has been based on a careful reading of the Terms of Reference, and on discussions and meetings with representatives of the City of Hamilton and members of the multi-disciplinary team.

The team shown on Exhibit 1 has been assembled for the study by De Leuw Cather, who would take full responsibility for organizing and managing the project. De Leuw Cather has worked successfully on similar multi-disciplinary feasibility studies with several of these firms, notably, Ecologistics Limited, Project Planning Associates Limited and Earl Berger Limited.

In selecting the team members De Leuw Cather has been guided by its awareness and understanding of the wide range of issues and impacts which must be dealt with carefully for the study to be successful. The Consultants believe that the team contains the proper balance of skills and experience needed in the fields of transportation engineering, the natural and the man-made environments, and public participation.

SUMMARY

The recommended Work Program is described in Section 2. It is proposed that the study be divided into two stages:

- Stage I - Need For The Route
- Stage II - Route Identification And Selection

Stage I would be concerned with justification of the proposed roadway, based on considerations such as the present and future dependence of Bay-front industries on heavy traffic; the adverse transportation, social, environmental and economic effects of not building the road; and the sort of problems as well as the opportunities presented by constructing it. The Consultants believe that the roadway must be warranted on traffic, engineering, economic, social and land-use planning grounds, and that public support will not be forthcoming unless its need is demonstrated. Stage I therefore has been designed to produce the evidence for or against the roadway in a very short time - about 14 weeks. This period would also include a public participation program to give the information required by the citizens and the industries to make their opinions known. If the roadway is not justified, or is not acceptable to the public, then the study can be terminated without going into extensive, detailed investigations planned for Stage II.

The preliminary schedule for Stage I is shown in Exhibit 2A. Fees and expenses would be in the order of \$25,000 to \$28,000.

Stage II would be concerned with identification of the feasible alternatives for the roadway, evaluation and comparison of these, and selection of the recommended alignment. An early task would be to make coarse analysis of all the possible routes in order to screen out the obviously impractical ones. Much of the work following would consist of preliminary engineering design of the alternatives in sufficient detail to develop traffic operational plans, construction and maintenance costs, property needs, noise effects, and impacts on and constraints generated by the natural environment and the affected neighbourhoods. The public participation program would be continued.

Evaluation of the alternatives would be carried out together with the public and city officials. The consensus as to the recommended route would be presented to the elected officials for their decision.

Exhibit 2B shows the preliminary schedule for Stage II. It would last about 46 weeks. Estimated fees and expenses for this stage would range from \$140,000 to \$143,000.

Thus the total estimated cost in fees and expenses for Stages I and II is about \$168,000, and should the second stage follow immediately after the first, the study would last in the order of 15 months.

THE MULTI-DISCIPLINARY TEAM

NATURAL ENVIRONMENT	-	<i>Ecologistics Limited</i>
MARINE BIOLOGY	-	<i>Dr. Graham Harris</i>
NOISE	-	<i>National Research Council of Canada</i>
GEOTECHNICAL ENGINEERING	-	<i>Racey, MacCallum & Bluteau Ltd.</i>
TUNNELLING	-	<i>Hatch & Associates Limited</i>
LAND USE PLANNING	-	<i>Project Planning Associates</i>
LANDSCAPE ARCHITECTURE & RECREATION PLANNING	-	<i>Project Planning Associates</i>
WATER-ORIENTED RECREATION	-	<i>Dr. Reiner Jaakson</i>
SOCIAL PLANNING	-	<i>Interthink</i>
PUBLIC PARTICIPATION	-	<i>Earl Berger Limited</i>
PROJECT MANAGEMENT	}	<i>De Leuw Cather, Canada Ltd.</i>
ECONOMICS		
TRAFFIC PLANNING & OPERATIONS		
ENGINEERING		

EXHIBIT 1

PERIMETER INDUSTRIAL ROAD, HAMILTON

SECTION 2 - PROPOSED WORK PROGRAM & STUDY SCHEDULE

INTRODUCTION

The proposal is that the Work Program consists of two basic stages:

STAGE I - NEED FOR THE ROUTE

STAGE II - ROUTE IDENTIFICATION AND SELECTION

This arrangement has been adopted because of the feeling that the success of the study will depend as much on public acceptance of the proposal as on technical grounds supporting its construction. Therefore, it is mandatory it be demonstrated that the Perimeter Industrial Road is indeed required. Stage I is designed to provide such evidence fairly quickly, and in the case where the road is found not justified or not acceptable to the public, the study may then be terminated without having incurred substantial costs in detailed investigations.

STAGE I - NEED FOR THE ROUTE

Sufficient data collection and analysis would be carried out in the areas of traffic planning, engineering, economics and the natural and man-made environments. In order to delimit the geographic extent of the investigations some preliminary studies will be required as to the possible alternatives for locating the roadway.

Concurrently with this work a public participation program would be undertaken to give the citizens, industries and others affected the information they need to become aware of the issues, and to allow them to make their opinions known to the authorities and the planning team.

The objective is to ensure the public is properly informed of the need for the road and aware of the implications of not building it, and why that particular part of the City has been chosen as the Study Area.

Closely integrated with the public participation program there would be a social planning program aimed at forming an appreciation of the structure of affected neighbourhoods and the potential impact upon them of the preliminary alternative proposals for the roadway.

The justification of the roadway will be based on a number of fundamental considerations, including:

- . the extent to which industry on the Bay depends on heavy trucking;
- . possibilities for change of emphasis in modes used for handling raw materials and finished products;
- . the growth foreseen in industrial road traffic and likely geographic distribution of entry points into the City;
- . adverse social, environmental and economic effects of permitting industrial traffic to continue present circulation patterns. In particular the impacts on neighbourhoods and on the Central Business District;
- . conversely, the opportunities for improving neighbourhoods and the Central Business District by removal of heavy traffic;

- . the nature of the problems and impacts that could be generated elsewhere by constructing a new roadway, as well as the opportunities provided for creating or adding to amenities for the enjoyment of the local residents and the public at large.

SCOPE OF THE WORK - STAGE I

a) Traffic Planning and Operations

The results of the Trucking Study and the Transportation Strategy Study would be examined for pertinent data and conclusions. In all likelihood the Trucking Study will prove to be the more important in this respect; some special tabulations may be requested, particularly for peak period and peak hour movements across the screen-lines. Any relevant material in the possession of the Ministry of Transportation and Communications would also be examined.

Gross projections would be made of truck and automobile movements in the area under study to provide a basis for traffic planning, and for estimating the social and environmental impacts produced by additions or reductions in traffic volumes in sensitive areas.

b) Engineering

All available material and mapping would be collected and analyzed dealing with soils conditions, including boreholes; utility locations; unit capital costs for construction and maintenance of roadway and structures, including tunnels; and user costs.

c) Natural Environment

Both aquatic and terrestrial systems are involved. In order to predict the consequences of changing present conditions, information would be gathered and reviewed on the physical characteristics of the water bodies; the food chains and productivity of the system; and the biological life. The terrestrial systems would be examined in the same way - study being made of the relations between the physical base (soils) and the biological organisms, and how they would be affected by the roadway alternatives.

d) Noise

Measurements would be made of existing noise levels on major roads in the Study Area, and of noise levels in areas likely to be affected by the proposed roadway.

e) Land Use Planning

Data would be collected to determine existing and proposed zoning and land uses; extent and limitations of existing development; property ownership, land value, population density and characteristics for the Study Area. Pedestrian movement patterns and community social, recreation, education and park facilities would be determined.

This work would assist in assessing the need for the proposed route. In addition, local neighbourhood planning requirements would be determined which will provide alignment constraints that should be recognized by proposed route alternatives.

Base maps indicating the results of these surveys would be prepared.

f) Landscape Architecture

As part of the environmental assessment an analysis would be undertaken of the visual impacts and implications of roads on the land and waterscapes, giving particular emphasis to the aesthetic and physical impact on Dundurn Park and the Royal Botanical Gardens. Plans, perspectives and photography would portray the existing conditions and potential adverse impacts.

The existing topography and vegetation on the Bay side of Highway 403 would be assessed including species, physical condition and value of existing trees and shrubs, slope and drainage constraints.

g) Recreation Planning

In conjunction with the land-use planning in Stage I a review would be made of recreation requirements for sail and power boats, and other park and waterfront recreation facilities. This information will serve as one of the bases for establishing the rationale for planning, land acquisition and development of water-oriented recreation facilities in conjunction with any of the alternatives involving crossing the Bay or land-fill operations. In addition, the recreation planner would be involved with the social planner in group meetings to determine local recreation needs.

h) Social Planning

The social planning element in Stage I would include:

- An examination of the resident and commercial structure of the neighbourhoods in the Study Area;
- Interaction and interdependence factors that influence the present neighbourhood structures;
- An evaluation of the strength and stability of the existing areas;
- Projections and hypotheses relative to the various routing proposals' effects on existing neighbourhoods;
- Conclusions and recommendations based on social impact probability in addition to the above-mentioned examinations.

i) Public Participation Program

Stage I would contain one cycle of participation. This would involve discussions with the residents on the need for the Perimeter Industrial Road as well as the implications of not building it related to the Study Area. There would also be an identification of those locations and activities within the Study Area which are relevant to locating possible routes.

The basic method will be public meetings held in all sections of the Study Area. A *CYCLE* consists of one round of public meetings held in all parts of the Study Area, along with meetings with individuals and special interest groups. All interested groups and individuals would be asked to involve themselves in the program.

The main thrust of public information would be information booklets prepared by the planning staff with the assistance of the participation team and distributed to all households in the Study Area and to other interested groups and individuals. In addition, special information packages would be prepared for those who wish more detailed and technical information. Every effort would be made to make the optimum use of all media. Where appropriate, information centres would be set up. Interested individuals and groups outside the Study Area would be invited to join in the participation program. To the extent appropriate, efforts will be made to use community resources and networks, such as the neighbourhood committees.

STAGE II - ROUTE IDENTIFICATION AND SELECTION

The Work Program in this stage is designed to conform to the requirements described in the Terms of Reference under Engineering and Other Services. Further data collection and analysis would be carried out to provide a firm base for the more extensive investigations conducted here.

SCOPE OF THE WORK - STAGE II

Route Identification

A very early task would be to identify clearly all the feasible alternatives for the roadway. In addition to those suggested by the City others would be explored to make sure all reasonable possibilities have been selected; in all probability concepts of most of these will have been brought forward in the Stage I analyses and public partici-

pation program. A fairly coarse but comprehensive analysis would be made to screen out unfeasible alternatives. At least four would then be presented for review and approval by the Technical Coordinating Committee before proceeding further.

a) Traffic Planning and Operations

Of primary importance would be the rush hour traffic assignments called for in the Terms of Reference under the policy options outlined of prohibiting or allowing heavy vehicles on certain streets. The Consultants consider that simplified traffic generation and assignment procedures would be more than sufficient to provide sound information for this purpose. These procedures have already been successfully used for strategy planning purposes by the City of Hamilton and by De Leuw Cather in Windsor and London. It appears at this point that hand-assignment techniques will be quite suitable. A fundamental objective will be to develop traffic schemes which not only satisfy the particular requirements of each industrial road alternative, but also improve overall traffic operation in the Study Area.

b) Engineering Design

The engineering investigations would cover all preliminary design questions such as roadway and interchange geometry and configuration of alternative schemes, effects on major utilities, property needs, and capital and maintenance costs.

c) Economics

In the economics sphere preparations would be made for undertaking cost-benefit or similar types of analysis, using the

results of the traffic assignments and the cost estimates from the engineering studies, as well as other sources of information.

d) Noise

Estimated noise level contours would be produced along each alternative route together with contours of increase in noise level in affected residential areas. This analysis would be based on the location of the proposed alignments and grade separations and intersections, and the estimated traffic volumes and vehicle mix for each route.

e) Land-Use Planning

Land-use planning would involve review of the alternatives for the roadway to ensure that they are compatible with land uses and zoning requirements within the Study Area.

f) Landscape Planning

In conjunction with the other team members, landscape concept plans would be prepared showing the potential for development of water and land areas alongside or close by each alternative under study. These sketch plans will indicate park and recreation uses, access points, parking, vegetation and landscape themes. Grade relationships between the alternatives and existing routes (such as Highway 403) would be given careful study. Preliminary grading plans would be prepared showing the integration of landscape and engineering requirements. Cost estimates for landscaping needs would be made for each alternative, and for any associated park and recreation areas.

g) Natural Environment

The impacts of each alternative on the aquatic and terrestrial ecosystems would be analyzed in detail. Harmful situations would be identified, and recommendations would be made as to ways of eliminating or reducing the impacts in the design stage, or by adopting certain practices during construction.

h) Social Planning

Social planning input would include direct participation with the planners and designers in reviewing alternative route proposals, and testing their impact and acceptability on the residents and neighbourhoods. Consideration would be given to setting up an on-going monitoring program to obtain responses and reactions of the residents. This could serve as a cross-validation of responses from the public participation program.

i) Public Participation Program

In the public participation program two further cycles would be involved once the need for the roadway has been clearly established. Cycle 2 would deal with the question of routes. It would seek to clarify those issues, activities and places of particular importance to the residents, to identify possible routes through the Study Area and to explore the implications of each. Cycle 3 would be designed to obtain the public's views on the one or perhaps two routes which are best from the technical standpoint, and have the least impact on the Study Area.

Evaluation and Selection of Recommended Route

Evaluating the alternatives and selecting the recommended route is not an easy matter when so many diverse and often opposing issues and impacts are involved, many of which also are not quantifiable. However, recent experience in similar studies has demonstrated there are acceptable ways of making the evaluation. To be done successfully these should involve the public and City officials as well as the multi-disciplinary team. Broadly speaking the procedure involves the selection of specific social, economic, engineering and environmental objectives or factors considered of paramount importance in choosing a route, and evaluating the alternatives against these by ranking or rating them in a structured, methodical way. The objective is to allow a consensus to emerge, having adequate information and facts to hand covering all areas of concern to the officials and the community at large. The matter then becomes one for discussion and decision by the elected representatives of the community.

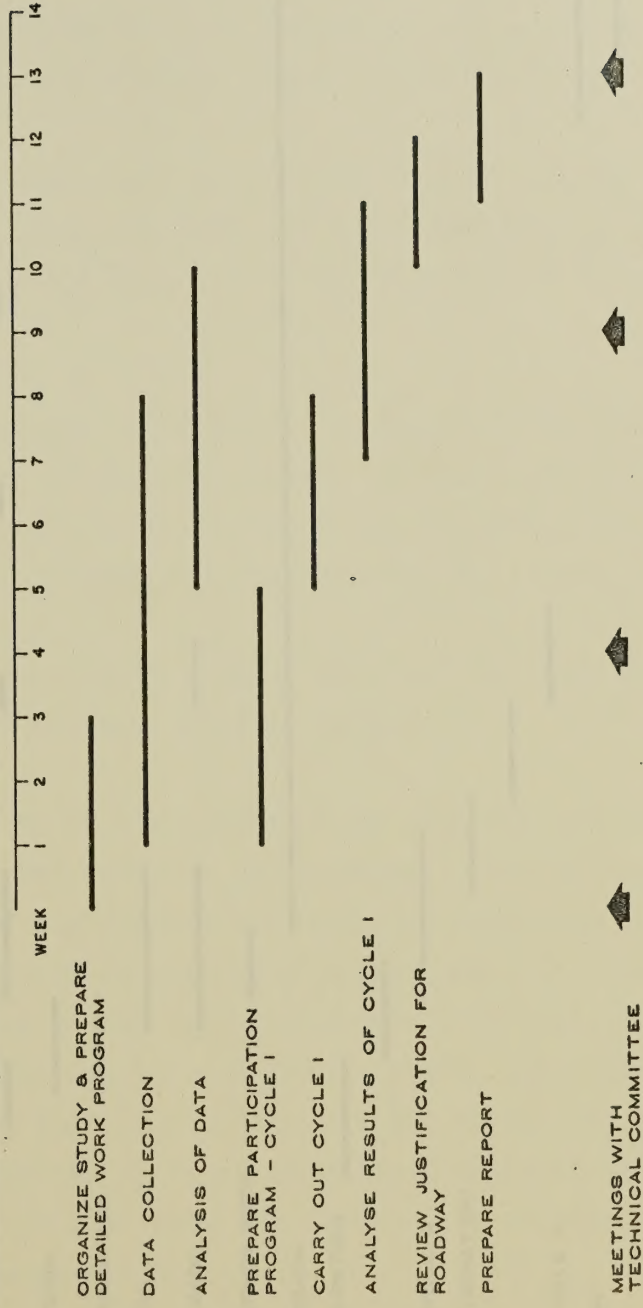
STUDY SCHEDULE

The starting date for the project is conditioned by the need of the public participation and social planning programs to avoid vacation periods. Thus, the earliest start would be about the middle of September.

Exhibits 2A and 2B show the preliminary schedules for Stages I and II respectively. Stage I it is thought would take about 14 weeks to complete. Stage II, a much more extensive investigation, would last about 46 weeks. Thus, if the roadway is found justified and there is no break between the two stages, the total duration would

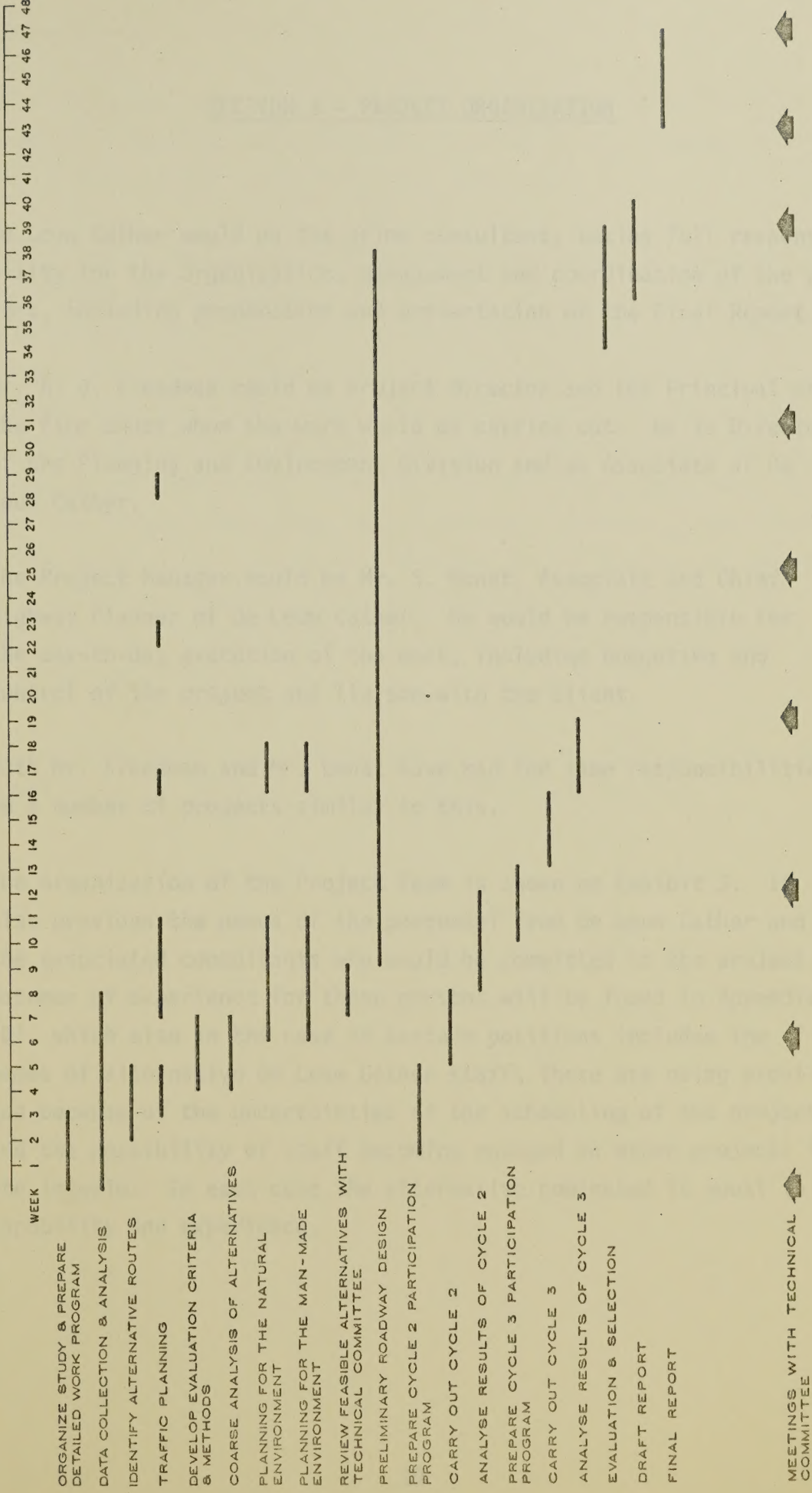
be approximately 60 weeks or about 15 months. It is emphasized that this scheduling is tentative at this point in time and that, in fact, the first step in both phases would be to prepare a detailed work program.

STAGE I - NEED FOR THE ROUTE



PERIMETER INDUSTRIAL ROAD, HAMILTON
PRELIMINARY SCHEDULE - STAGE I

STAGE II - ROUTE IDENTIFICATION AND SELECTION



SECTION 3 - PROJECT ORGANIZATION

De Leuw Cather would be the prime consultant, taking full responsibility for the organization, management and coordination of the project, including preparation and presentation of the Final Report.

Mr. A. J. Freedman would be Project Director and the Principal of the firm under whom the work would be carried out. He is Director of the Planning and Environment Division and an Associate of De Leuw Cather.

The Project Manager would be Mr. S. Donat, Associate and Chief Highway Planner of De Leuw Cather. He would be responsible for the day-to-day execution of the work, including budgeting and control of the project and liaison with the Client.

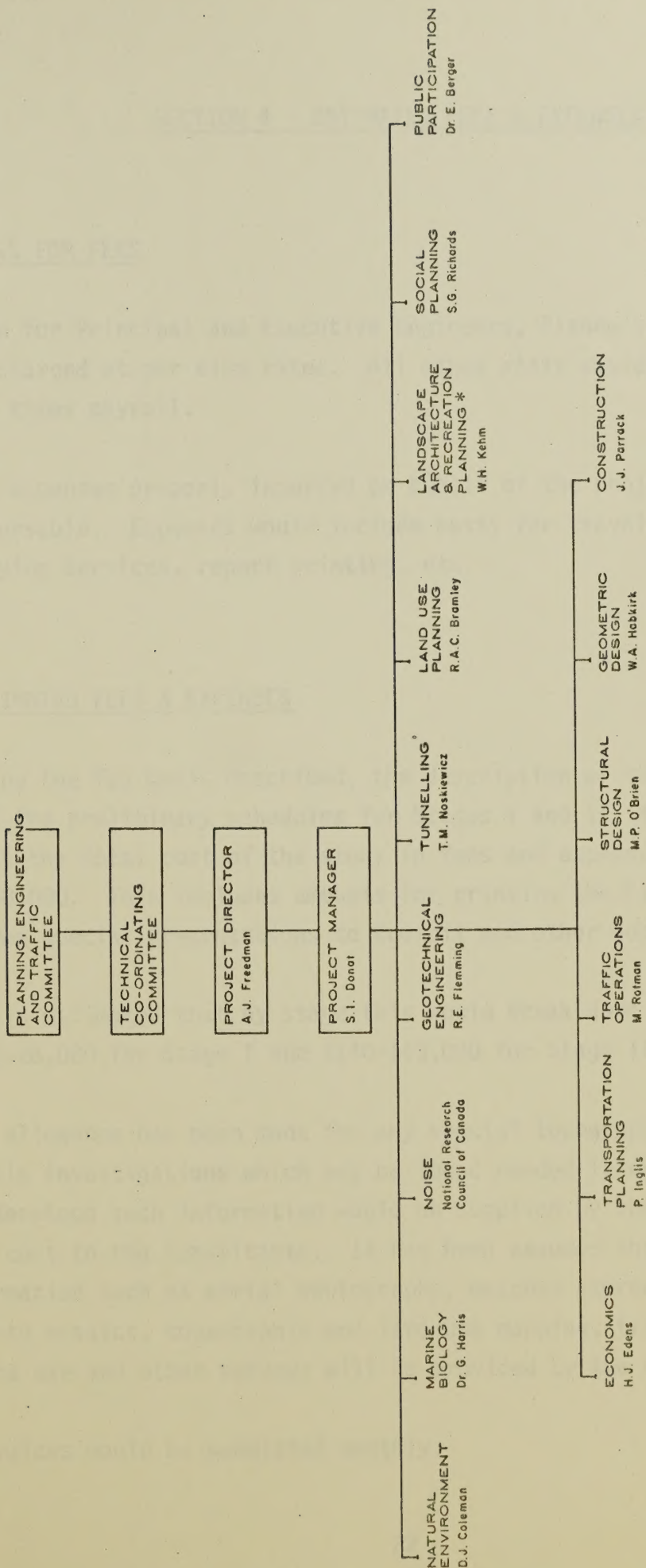
Both Mr. Freedman and Mr. Donat have had the same responsibilities on a number of projects similar to this.

The organization of the Project Team is shown on Exhibit 3. It also provides the names of the personnel from De Leuw Cather and the associated consultants who would be committed to the project. Resumes of experience for these persons will be found in Appendix 'B', which also in the case of certain positions includes the names of alternative De Leuw Cather staff; these are being provided because of the uncertainties of the scheduling of the project, and the possibility of staff becoming engaged on other projects in the interim. In each case the alternative nominated is equal in capability and experience.

In the case of noise analysis, the Acoustics Section of the National Research Council has nominated Dr. Embleton or Dr. Thiessen as the most likely candidate for this specialized task.

All reporting to the Technical Coordinating Committee would be by way of the Project Manager. In addition to regular meetings to review progress and discuss the on-going work program, the Project Manager would be in contact with the Committee continuously for general assistance and advice and, as important, for the purpose of effecting liaison with other municipal departments and outside agencies and authorities. Some of these outside groups would be: Hamilton Harbour Commission, Royal Botanical Gardens, local industries, major utility companies, the Ministry of Transportation and Communications, Ministry of Natural Resources, Ministry of the Environment, and the Ministry of Treasury, Economics and Intergovernmental Affairs.

Arrangements have been made to set up a project liaison office in Hamilton in the offices of Racey, MacCallum and Bluteau.



*SPECIAL ADVISOR ON WATER-ORIENTED RECREATION
Dr. Reiner Jackson

SECTION 4 - ESTIMATED FEES & EXPENSES

BASIS FOR FEES

Time for Principal and Executive Engineers, Planners and others would be charged at per diem rates. All other staff would be charged at two times payroll.

All expenses properly incurred on behalf of the project would be reimbursable. Expenses would include costs for travel, telephone calls, copying services, report printing, etc.

ESTIMATED FEES & EXPENSES

Using the fee basis described, the description of the work program and the preliminary schedules for Stages I and II, it is estimated that the total cost of the study in fees and expenses would be about \$168,000. This includes amounts for printing the Final Report and three special presentations to Council and other bodies.

It is estimated that by stage this would break down in the order of \$25-28,000 for Stage I and \$140-143,000 for Stage II.

No allowance has been made for any special topographic mapping and soils investigations which may be found needed later on, as it is understood such information would be supplied by the Corporation at no cost to the Consultants. It has been assumed that all base information such as aerial photography, matched stereo pairs or air photo mosaics, topographic and land-use mapping, traffic, soils, land use and other surveys will be provided by the Client at no cost.

Invoices would be submitted monthly.

BACKGROUND ON THE TEAM MEMBERS

DE LEUW CATHER, CANADA LTD.

De Leuw Cather specializes in the fields of transportation, civil and municipal engineering, pollution control, and urban and environmental planning. The capabilities of the firm range from feasibility studies and conceptual planning to contract design and construction supervision.

The firm recently has directed and managed a number of multi-disciplinary feasibility studies. These have involved the identification and evaluation of alternative road corridors and the selection of the best route within the optimum corridor. The studies have taken account of a wide range of social, environmental, economic, engineering and transportation impacts and objectives. Examples are the Barrie Bypass, the Peterborough Bypass, Highway 26, Barrie to Stayner (all for the Ministry of Transportation and Communications), the Proposed Edmonton and Calgary Ring Roads, and the Investigation of Alternative Alignments for the Gardiner Expressway Extension.

EARL BERGER LIMITED

The firm concentrates on community development and research, including socio-economic research and planning, and public participation. It has been involved in a number of public participation programs during the past few years. One of the earlier ones was the Local Orientation and Identification Study for the Haldimand-Norfolk Study. That study, which began as a straightforward attitude and market study, was developed into a large-scale participation program involving 150 groups across 1,000 square miles in three months. In the past twelve months the firm has been involved in close to a dozen participation programs of various kinds and scale.

ECOLOGISTICS LIMITED

Ecologistics Limited is a team of ecologists, recreation planners, urban and regional planners, geographers and economists. The firm combines abilities in the physical and biological sciences with the behavioural and design disciplines. Capabilities include analyses of:

- | | | |
|---------------------|---|--|
| Soils/Geomorphology | - | Land capability and constraints |
| Water | - | Functional analyses of hydrologic systems |
| Vegetation | - | Synecological, autelological analyses |
| Wildlife and Fish | - | Inventory, analyses and management studies |

This experience has been used in a number of projects such as:

Environment impact studies

Ecological and amenity studies of transportation facilities

Recreation demand studies, park development and open space planning

HATCH ASSOCIATES LTD.

Hatch Associates have served as consulting engineers on a number of tunnel projects for highways and railroads. The firm's experience includes specialized design of tunnel shields and linings, the development of new concepts in the use of materials, and methods of construction, and the supervision of construction.

Clients include the Department of Highways, Ontario, Toronto Transit Commission, Toronto Harbour Commissioners, Ontario Water Resources Commission, and the Hydro-Electric Power Commission of Ontario.

INTERTHINK

Interthink provides services to government and industry in the fields of social planning, motivational research and consumer awareness. Since its inception the firm has designed and managed a number of studies involving sociological research programs. Principal among these are: a tourist development plan study in Cobalt, Ontario; an appraisal of user needs, Proposed Bronte Creek Park, Ontario; and an attitudinal survey of residents, industry and commerce to determine recreational needs and wants, Hamilton-Wentworth Waterfront Study.

PROJECT PLANNING ASSOCIATES LIMITED

Since its inception over 15 years ago as a multi-disciplinary undertaking, Project Planning Associates Limited has operated as a comprehensive multi-professional team. Throughout this period the scope of the Company's activities has embraced the whole range of urban, regional, social and site planning, architecture, landscape architecture and civil, municipal and marine engineering.

The comprehensive range of the Company's activities in Canada and in many other countries, includes the surveying, planning and development of new towns, the design, construction and provision of all major services in universities, hospitals, schools and other institutional buildings, and the planning and development of industrial parks.

Project Planning Associates Limited has extensive experience in all aspects of landscape architecture and site planning; working with both public and private agencies it has developed many major recreational, tourism and leisure-time facilities, including parks, marinas, docks and waterfront and aquatic parks.

RACEY, MacCALLUM & BLUTEAU LTD.

The firm provides the following geotechnical services:

Soil investigations and foundation studies. Determination of engineering properties of soil and rock by means of diamond drilling, dynamic cone penetrations and in-situ sampling. Preliminary evaluations by test pits. Field test to establish in-situ strength, permeability, bearing capacity, settlement and failure characteristics of soil and rock. Over water investigations using special marine equipment.

Topographic surveys. Soil and rock seismic investigations. Control of quality and compaction of fill material for buildings, roads, dams and reservoirs. Nuclear density methods. Reconnaissance and engineering geology. Hydro-geology, including determination of aquifers and development of water supply systems.

Racey, MacCallum & Bluteau Ltd. has carried out many soil investigations and geotechnical studies throughout Eastern Canada including numerous projects in the Hamilton area. In excess of fifty (50) marine boreholes have been drilled in the Hamilton Harbour within the past twelve (12) months for the Steel Company of Canada and an eighteen (18) borehole program is presently underway.

APPENDIX 'B'

RESUMES OF KEY STAFF

47 Colborne Street, Toronto, Ontario M5E 1E3 / 495 Dundas Street, London, Ontario N6B 1W4

Earl Berger is a graduate (B.A. Hon.) of the University of Toronto and the London School of Economics (Ph.D. Econ.) and an Ontario Land Economist. He spent a year in Ghana as Lecturer in Politics, University of Ghana, and Special Lecturer, Institute of Public Administration. On his return to Canada he was on the Editorial Board of 'The Globe and Mail' and, for a time, specialist writer on education and social welfare.

His firm concentrates on community development and research, including socio-economic research and planning, and public participation. He has been involved in a number of public participation programs during the past few years. One of the earlier ones was the Local Orientation and Identification Study for the Haldimand-Norfolk Study. That study, which began as a straightforward attitude and market study, was developed into a large-scale participation program involving 150 groups across 1,000 square miles in three months. In the past twelve months, he has been involved in close to a dozen participation programs of various kinds and scale. The largest is the London Urban Transportation Study, involving 220,000 residents. In addition, he is carrying out public participation programs in connection with a number of MTC Feasibility Studies: the extension of Highway 402 southwest of London; Highway 28 bypassing Peterborough; Highway 69 in the Sudbury area; and Highway 26 from the proposed Barrie Bypass to Stayner.

He has been appointed by the Minister of Transportation and Communications as his representative to hold public hearings in connection with disputed freeway projects: Highway 406 in St. Catharines, and the Brantford Freeway. He was also involved in the MTC's telecommunications survey.

He has been retained by the St. John River Basin Program in New Brunswick to evaluate their public participation program. He is technical advisor to the Ontario Advisory Task Force on Housing Policy.

R.A.C. Bramley Project Planning Associates
Ltd.

Education Master of Arts (Geography), University of Cambridge,
Diploma in Town Planning, Edinburgh College of Art.

Membership Member, Royal Town Planning Institute
Member, Town Planning Institute of Canada
Member, Community Planning Association of Canada.

Experience

1969 (part) to date

Mr. Bramley was formerly Senior Planner in the Halifax office of Project Planning Associates Limited where his duties included directing the preparation of the Official Community Plan, City of Bathurst, N.B., and the Windsor/West Hants Joint Planning Study. Other assignments included establishing planning parameters and market demand for the Cape Breton Federal-Provincial Land Assembly, and for Centennial Place, Moncton, N.B., and the preparation of economic and planning studies for several other residential, commercial and industrial development in the Halifax-Dartmouth area.

During this time he acted as Interim Director, Cape Breton District Planning Commission for a period of eighteen months with responsibility for directing the work of commission staff in establishing regional planning policies, preparation of municipal plans and supporting legislation and in providing planning advice to participating municipalities for a region of 130,000 persons.

Following his transfer to Toronto in Ontario 1971, Mr. Bramley worked as the Planner on the project team preparing the detailed development proposals for the Pickering-Ajax Sector of the Metropolitan Toronto Waterfront prepared for the Metropolitan Toronto and Region Conservation Authority.

This was followed by an assignment as Project Co-ordinator and Planner in a multi disciplinary team commissioned jointly by the Municipality of Metropolitan Toronto and the Province of Ontario to investigate the feasibility of establishing a Sports and Recreation Complex to serve the Toronto-Centred Region.

More recently, Mr. Bramley has been providing land use and planning input into the Halton-Wentworth Waterfront Study, a comprehensive examination of development trends and policy determination for Hamilton Harbour and the west end of Lake Ontario, being prepared for the Halton and Hamilton Region Conservation Authorities.

LAND USE PLANNER

1966-1969

Assistant Area Planning Officer, Durham County Council, England, responsible for control of development in six urban and rural districts containing approximately 200,000 persons, including 6 months deputising for area officer. Duties included evaluation of planning applications and making recommendations to District Councils, also meetings with public and private developers, district officials, and councillors and representing the Local Planning Authority at local Public Inquiries into planning decisions appealed to the Minister of Housing and Local Government.

1965-1966

Planner working for the City of Glasgow, Scotland. Member of urban renewal team, responsible to team leader. Participated in survey, data analysis and scheme preparation and implementation. Co-ordinated activities of other City departments and other development agencies in relation to compulsory purchase, relocation, demolition, service diversions and closures, new construction.

1963-1964

Research Assistant, City of Edinburgh, Scotland. Researched and updated statistical data on population and housing, employment, CBD development projections and parking requirements as part of the Quinquennial Review of the City Development Plan.

DEREK J. COLEMAN



EDUCATION: Ph.D., School of Urban and Regional Planning
University of Waterloo (expected 1973)
M.Sc., Centre for Resources Development,
University of Guelph, 1968
B.Sc.F., Faculty of Forestry,
University of Toronto, 1966

SOCIETIES: Canadian Institute of Forestry
Soil Conservation Society of America
American Society of Planning Officials
Ecological Society of America

OFFICE: Principal, Ecologistics Limited
(an affiliate of De Leuw Cather)

EXPERIENCE RECORD:

- Current Current projects include an environmental impact study of the proposed Peterborough Bypass; evaluation of the ecological implications of ring roads in Calgary and Edmonton; studies on the environmental effects of land drainage for an industrial area in Ottawa.
- 1970 to 1972 Principal researcher on a study into ecology as applied to regional planning, sponsored by the Canadian Council on Urban and Regional Research. The study involved environmental inventories of Waterloo Country, Ontario, the design and operation of a data bank with computer graphic capabilities, the use of hydrologic simulation models and studies of ecosystem dynamics. Mr. Coleman presently serves on the Environmental Advisory Committee of the Waterloo County Area Planning Board.
- 1968 to 1969 Research Assistant, Department of Agricultural Economics, University of Guelph. Co-director of a study of land use in the Georgian Bay Economic Region of Ontario involving modelling of forest ecosystems and their relations to economic returns.

PUBLICATIONS: D. J. Coleman and I. McNaughton, "Environmental planning in Waterloo Country" and A.G. McLellan (ed). The Waterloo Country Area: Selected Geographical Essays, pp 241-53, 1971.

W. Van Vuuren and D. J. Coleman, Economic Implications of Rural Land Use in the Georgian Bay Economic Region of Ontario (Guelph: Centre for Resources Development No. 14, 1971), 173 p.

R. S. Dorney, et al, An Ecological Analysis of the Waterloo-South Wellington Region (Waterloo: University of Waterloo, 1970).

STEVEN I. DONAT

EDUCATION: B.Sc., University of Budapest, 1956
Civil Engineering (Honours)

OFFICES: Associate and Chief of Highway Planning
De Leuw Cather, Canada Ltd.

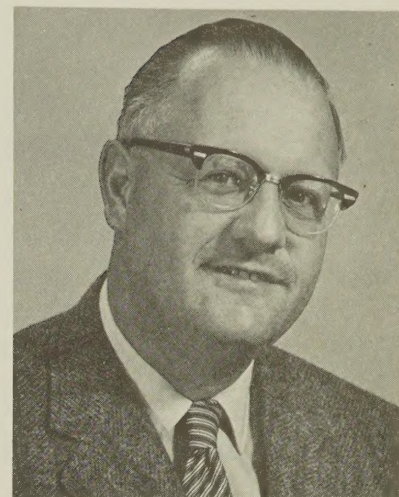
SOCIETIES: Association of Professional Engineers
of Ontario
Engineering Institute of Canada
Institute of Traffic Engineers

EXPERIENCE
RECORD: With De Leuw Cather since 1965



- 1973 to Date Responsible for all highway planning projects and feasibility studies carried out by De Leuw Cather. Project Director, Edmonton-Calgary Ring Road Evaluation, Department of Highways and Transport, Alta.
- 1969 to 1973 Senior Highway Planner responsible for the preparation of feasibility study reports including identifying techniques and approaches for handling the socio-economic and environmental considerations. Project Manager coordinating the multi-disciplinary evaluation of the engineering, social, economic, aesthetic and ecological effects of alternative corridors and/or routes for a number of major urban and rural highway projects.
- 1965 to 1969 Project Manager, responsible for the functional planning studies of major urban and rural freeways, expressways, arterials and urban streets, including route locations and preliminary engineering reports.
- Participating in the preparation of the Toronto International Airport Study including evaluation of alternative ground transportation systems to alternative sites on a conceptual basis with cost estimates; analysis and review of the existing airport as part of the regional transportation system; functional planning concepts of airport access in general including passenger and cargo either by means of roadways and/or rapid transit; access and circulation internally between terminal buildings, etc.
- Assisting the Functional Planning Study of rapid transit lines that is known as the Central Area Systems Study (CASS) in Boston, Massachusetts, performing the following functions: reviewing existing system, alternative system concepts, planning of alignment, station layout, construction and operational methods together with cost estimates.
- 1964 to 1965 Damas & Smith, Ltd. Senior Project Engineer in charge of various municipal projects in Georgetown, Galt, Lindsay, Cornwall, etc.
- 1961 to 1964 McCormick and Rankin Ltd. Project Engineer on highway design projects.
- 1958 to 1961 Giffels and Associates Ltd. Project Engineer on major highway projects.

HENK J. EDENS



EDUCATION: Delft University, Holland, M.Sc.,
(Civil Engineering, 1951)
York University, Toronto, M.A. (Economics, 1973)

OFFICE: Associate of De Leuw Cather, Canada Ltd.
and Chief Systems Engineer

SOCIETIES: Association of Professional Engineers
of Ontario
Engineering Institute of Canada
Institute of Traffic Engineers
Transportation Planning Computer
Exchange Group (TPEG)

EXPERIENCE

RECORD: With De Leuw Cather since 1956

1973 to Date Economist and Chief Systems Engineer

1971 to 1973 On leave of absence during academic years: 1971-1972; 1972-1973.

1965 to 1973 Associate since 1967. Chief Traffic Engineer in responsible charge of all traffic- parking studies carried out by the Company. Typical projects are: Thunder Bay Parking Garage Study; comprehensive routing and planning studies for the transit systems of Hamilton, Windsor and Kingston; express bus ridership study in Ottawa; traffic generation analysis for Toronto Airport Location Study; Manchester, England, development of transit network for model testing; Bureau of Public Roads (United States) three computer programs for IBM 360 transportation planning package in cooperation with De Leuw, Cather & Company of Chicago; Quebec Area Transportation Study, City of Chatham re analysis of traffic study, and methods and model work for the Durban Area Transportation Study.

1962 to 1965 Senior Transportation Planner engaged in Ottawa-Hull Area Transportation Study. Project Manager on transit study for St. John's Transportation Commission, Newfoundland, and parking and circulation study, Midtown Plaza, Saskatoon, Saskatchewan; passenger projections for Metropolitan Toronto and Region Study of commuter rail service potential along the Lakeshore.

1956 to 1962 Project and Traffic Engineer. Connecting link study for the City of Sudbury; traffic planning report for Lakehead cities of Port Arthur and Fort William; comprehensive traffic and parking studies for the cities of Saskatoon, Saskatchewan, and Chatham, Ontario; Grand River Crossing Study for the City of Brantford. Report on location for new inter-provincial bridge in Ottawa and Golf Street Grade Separation, City of North Bay.

1954 to 1956	Town Planning Consultants, Toronto.	Traffic Engineer
1953 to 1954	Department of Highways, Ontario.	Soils Engineer
1952 to 1953	Department of Public Works, Holland.	Highway Design Engineer

DR. T.F.W. EMBLETON

NATIONAL RESEARCH COUNCIL

NOISE CONSULTANT (ALT)

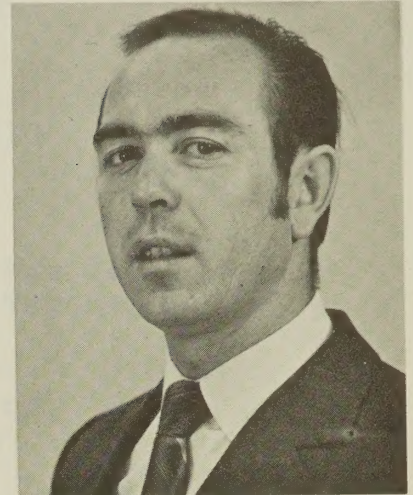
T.F.W. Embleton, born 1929, Hornchurch, Essex, England; University of London, B.S.C. 1950, Ph.D. 1952, D.Sc. 1964; National Research Council of Canada, Ottawa, 1952 - date, Senior Research Officer in Acoustics Section, Division of Physics; Acoustical Society of America, Biennial Award 1964, Chairman Technical Committee on Noise 1964-67, member Executive Council 1968-71, Associate Editor for Noise of J. Acoustical Society of America 1970 - date; summer session lecturer Massachusetts Institute of Technology, 1964, 1968 and 1972 in noise control; various scientific, technical and consulting activities in industrial and highway noise control (- 30 papers, 2 patents and numerous reports), especially noise and noise impact studies with G. J. Thiessen for alternate locations in Ottawa of Highways 417 and 416.

SIEGFRIED FASSMANN

EDUCATION: Institute of Technology, Munich,
Germany (1967)

SOCIETIES: Association of Professional Engineers
of Ontario

EXPERIENCE
RECORD: With De Leuw Cather since 1967.



- 1972 to Date Project Manager for Canadian National Railway contract on the Belfield Expressway. The project includes two reinforced concrete railway bridges and retaining structures, special shoring and tieback designs in the vicinity of hydro towers and railway diversions. This contract is presently under construction and anticipates some field supervision and field experience.
- Design and Construction Supervision for large size industrial production plant in Milton.
- Design of several precast composite bridges for Highway 417 in Ottawa.
- 1971 to 1972 Structural Engineer for design of a reinforced concrete parking garage in Chatham. Garage is in service and has three and one-half levels and provides 310 parking spaces. Provision was made for future expansion to six and one-half levels and 600 parking spaces.
- Design of Brock Road bridges over Highway 401 in Pickering Township. Bridges are five and three-span composite structures of pretensioned beams and cast-in-place slabs.
- Design of Horton bridges in London with post-tensioned cast-in-place deck slab.
- 1969 to 1970 Design Engineer on the rehabilitation of the steel superstructure and widening in structural steel and reinforced concrete of the Peace Bridge, Niagara Falls; design work for reinforced concrete bridges and culverts on the Autopista, San Lorenzo in Paraguay; also responsible for design of structural steel sign structures for the Scarborough Expressway and preliminary designs for Woodbine Interchange.
- 1967 to 1968 Design Engineer on the main structure and six ramps for the Scarborough Expressway - post-tensioned, multiple box girder construction, the ramps being curved with spans up to 200 feet.

REG. E. FLEMMING, P. ENG., BRANCH MANAGER, HAMILTON.

PERSONAL DATA: Born in Orillia, Ontario 1941.
Citizenship: Canadian
Marital Status: Married, one child

EDUCATIONAL BACKGROUND:

Primary and secondary school - Grade 12
Ryerson Institute of Technology, Toronto -
diploma in Civil Technology.

Completed prescribed Association of
Professional Engineers of Ontario
examinations for registration as
professional engineer, 1966.

PROFESSIONAL AFFILIATION AND MEMBERSHIPS:

Association of Professional Engineers of
Ontario.

Institute of Engineers, Jamaica.

Member Engineering Institute of Canada (MEIC)

Member Canadian Geotechnical Society (MCGS)

Member of Civil Technology Advisory Council,
Ryerson Polytechnical Institute.

PROFESSIONAL EXPERIENCE:

Over 10 years experience in Ontario, the
Maritimes and the Caribbean Area in geotechnical
investigations and materials engineering on
civil engineering works.

1972 to Present Joined RMB in January, 1972 as Branch Manager
of Hamilton office, being responsible for
administration, co-ordination and supervision
of company's activities in that area.

1970 to 1972 Warnock Hersey Caribbean Ltd., Kingston, Jamaica.
(Wholly owned subsidiary of Warnock Hersey
International Ltd.).

Held the position of Senior Soils Engineer and
acted as Project Manager on geotechnical
projects in Jamaica and throughout the Caribbean
area. One particular project was the stage
loading of large petroleum storage tanks founded
on bad ground in Jamaica. Co-authored a paper
on this project presented to the Engineers
Institute of Jamaica in July, 1971.

1962 - 1970

Warnock Hersey International Ltd.,
Professional Services Division. (Warnock
Hersey Soils Investigation Ltd. prior to
1967).

Started with this engineering firm which specializes in inspection and testing following graduation from Ryerson in 1962. Worked initially as a technologist in the Geotechnical Department doing all phases of work related to soil investigations, materials testing, and quality control inspection. Appointed Assistant Manager of the Geotechnical Department upon obtaining Professional Engineer registration in 1966. Directed the site explorations, operations, field and office personnel. Maintained liaison with clients and acted as Project Engineer on geotechnical and materials engineering assignments.

In addition to specifically geotechnical and materials engineering, obtained varied experience in related fields such as Benkelman Beam pavement testing, blasting vibration analysis and control. (A.P.E.O. thesis subject), gravel and quarry studies, coastal engineering and shoreline protection, mineral exploration drilling, materials engineering including asphalt and concrete, and geophysical studies by refraction seismic methods. A typical assignment involving airport construction, was Resident Engineer on Air Canada expansion of concrete parking areas and asphalt taxiways at Toronto International Airport (Malton).

ALLAN J. FREEDMAN

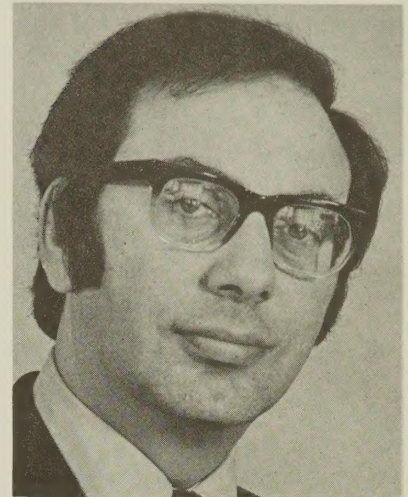
EDUCATION: B.A., B.A.I., Civil Engineering
Trinity College, Dublin, 1953
M.Eng., Transportation Engineering
University of California, Berkeley, 1961.

OFFICES: Director of Planning & Environment
Division and Associate

SOCIETIES: Association of Professional Engineers
of Ontario
Institute of Traffic Engineers
(Member Grade)

EXPERIENCE

RECORD: With De Leuw Cather since 1961

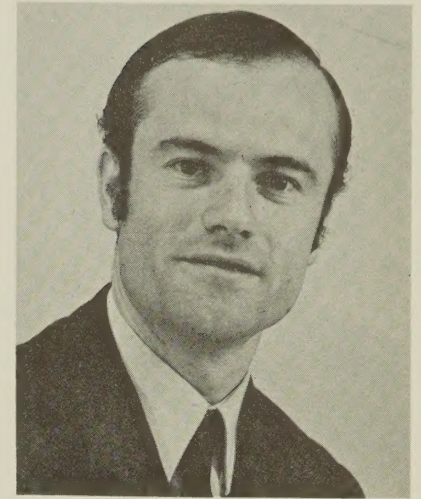


- 1970 to date Head Office, Toronto. Transportation Planning Coordinator on Consultants' interdisciplinary project team preparing North Pickering New Town Plan, Government of Ontario. Responsible for environmental planning aspects of all projects carried out by Canadian offices. Project Director, Barrie-Stayner Highway feasibility study, Ministry of Transportation and Communications, Ontario. Project Director, Mode-Access Study, Kejimikujik National Park, Nova Scotia, Department of Indian Affairs & Northern Development.
- 1967 to 1970 Partner, De Leuw, Chadwick, O'hEocha. Responsible for rapid transit and commuter rail planning in Manchester, Birmingham, Dublin and Helsinki; and feasibility studies of bus rapid transit and URBA rapid transit system (for Ministry of Transport, U.K.)
- 1962 to 1967 Toronto and Ottawa Offices. Project Manager on a variety of transportation planning projects including economic feasibility study for the Ontario Government of proposed international bridge at Kingston, Ontario; development of study procedures, market and service analyses, GO Transit, Metropolitan Toronto and Regional Transportation Study; and the Ottawa-Hull Areas Transportation Study, involving a 20-year road, mass transit and parking plan for the region. Lecturer in Traffic Engineering, University of Ottawa, 1964-65.
- 1961 to 1962 Toronto Office. Traffic Engineer on traffic and parking studies of Saskatoon and Chatham, and transit forecasts, Toronto Island Tunnel Study.
- 1960 to 1961 Recipient of Canadian Good Roads Association Scholarship undertaking postgraduate studies for M. Eng. degree at Institute of Transportation and Traffic Engineering, University of California, Berkeley.
- 1954 to 1960 Department of Highways, Ontario. Engaged in traffic control, highway planning and urban traffic studies; supervised urban section of Provincial Needs Study, 1959. Also engineer on construction of MacDonald-Cartier Freeway.
- 1953 to 1954 Town Planning Consultants Limited, Toronto. Junior planner on official plans and zoning studies.

ARNAUD R. de GOUVILLE

EDUCATION: Graduate Course in Transportation System Evaluation, University of Toronto, 1970
 B.A. Economics and Mathematics, Carleton University, 1969-1970
 Ecole Supérieure des Travaux Publics, Paris 1965-1968
 Certificates in Mathematics and Physics, Faculté des Sciences de Paris, 1963-1964

SOCIETIES: Engineering Institute of Canada
 Ingenieurs Civils de France
 Canadian Operational Research Society
 Institute of Traffic Engineers
 Corporation of Engineers of Quebec
 Montreal Economics Association



EXPERIENCE

RECORD: With De Leuw, Cather since 1970.

1970 to Date Montreal Office. Technical and economic feasibility of a railway link across the St. Lawrence for the Eastern Quebec Development Board; economic feasibility of a passenger car ferry for the City of Rimouski, Quebec; study of transportation in "Le Carrefour Laval", synchronization of traffic signals in Quebec City. Part-time lecturer in Transportation Economics at McGill University and Ecole Polytechnique, Montreal.

Toronto Office. Bus study in Kingston; cost analyses for Wentworth-Burlington Suburban Bus Study; forecasting of road expenditures in North Bay and St. John's.

1969 to 1970 Canadian Transport Commission, Ottawa. Transportation Analyst, Research Branch. Contributed to the CTC Inter-City Passenger Transportation Study and elaboration of a mathematical demand model; prepared a report and technical notes on Tracked Air Cushion Vehicles, (Hovertrain, Aerotrain, Urba). Involved in an International Air Rights Study, computation and projection of air volumes between the fifty major foreign points outside Canada and the U.S. and the eight major Canadian cities with conclusions and recommendations to the Air Transport Committee of the Canadian Transport Commission. Translator English-French, Transport Division, Secretary of State, Ottawa.

1968 to 1969 Secmo, Consulting Engineers, Paris. Engineer in industrial constructions specializing in reinforced and prestressed concrete, including some of the structures for the Boeing 747 parking at Orly Airport, Paris.

1968 Nord France Company, Paris. Construction Supervision at Versailles.

1967 Centre d'Essais des Structures, Paris. Prestressed concrete studies.

1966 Devin & Lemarchand Company. Construction supervision of roads and sewers.

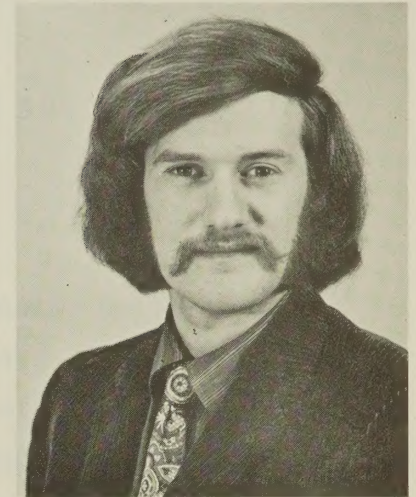
WILLIAM A. HABKIRK

EDUCATION: B.A.Sc., University of Toronto, 1965.

SOCIETIES: Association of Professional Engineers
of Ontario

EXPERIENCE

RECORD: With De Leuw Cather since 1965.



1965 to Date: Project Engineer assigned to the final design of a two-mile section of controlled-access Highway 417, a divided semi-urban freeway, including two interchanges in Ottawa, Ontario.

Project Manager on the design of 5 miles of Highway 416, a two-lane rural highway approximately 30 miles south of Ottawa. This involved full supervision of the design and preparation of drawings and documents for construction of the highway and associated roadways.

Also involved in functional planning for expansion of existing Toronto International Airport and in assessment of alternative airport sites in the Toronto region. These projects included traffic distribution, capacity analysis, staging and cost estimates for rapid transit and highway access and for internal circulation.

Project Engineer on the Highway 401 functional design, Scarborough to Oshawa, Ontario, a study of major improvements required on a 20-mile section of existing 4-lane highway to be upgraded to a multi-lane facility including 12 interchanges.

Project Engineer assigned to access and internal circulation studies for the North York Civic Centre and the Bramalea City Centre, Ontario. Assistant Project Engineer on the functional design of an 8-mile section of the East-West Freeway in Hamilton, Ontario in which alternative freeway and interchange locations, traffic distributions and capacities were studied.

Involved in functional planning studies for the Jasper Freeway, Edmonton, Alberta, the Harbour Drive Expressway, Halifax, Nova Scotia, and the Queen Elizabeth Way, Hamilton to St. Catharines, Ontario. Also involved in the feasibility study of the Downtown Distributor, Ottawa, Ontario and the Chatham, Ontario Transportation Study.

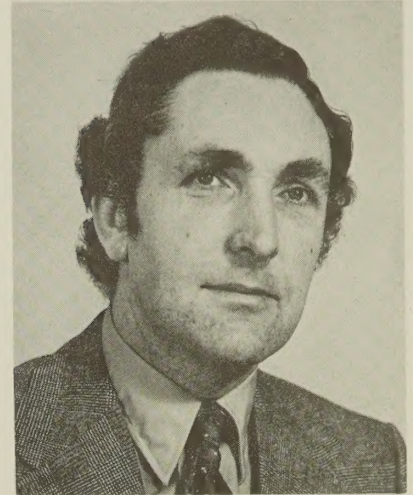
DR. G. P. HARRIS

MARINE BIOLOGIST

Dr. Harris is Assistant Professor of Biology at McMaster University. He holds the degrees of B.Sc. Honours 1st Class, Imperial College London; Associateship of the Royal College of Science, Imperial College, London; Diploma of Imperial College; and Ph.D. Imperial College, London.

Dr. Harris has intimate knowledge of the biological conditions of Hamilton Harbour. His current research program is concerned with the productivity of aquatic environments and studies are being carried out in Cootes Paradise and in Lake Ontario to the east of the Harbour. Examinations are being made of matters such as the rate of photosynthesis of algae in relation to nutrient levels (sewage), suspended particles (soil, silt) and light intensity; and the distribution of oxygen and the conditions at the bottom interface.

IAN G. HOLMES



EDUCATION: University of London, B.Sc.(Eng.) 1956,
Civil and Municipal Engineering

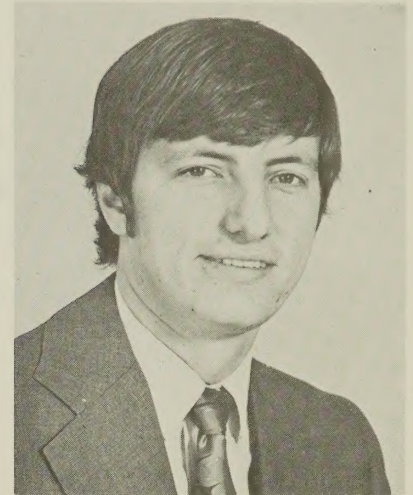
SOCIETIES: Association of Professional Engineers
of Ontario
Institute of Traffic Engineers
Institute of Engineers (Australia)

EXPERIENCE

RECORD: With De Leuw Cather since 1970

- 1970 to Date De Leuw Cather, Canada Ltd., Toronto. Project Manager on the Welland Transit Study; a transit operations study of the Hamilton system and on a functional and financial analysis of suburban bus service in the Wentworth-Burlington area. Project Manager on analysis of ground transportation requirements of alternative sites for Toronto International Airport. Analysis of roads, traffic access and parking requirements for public and private developments in Winnipeg, Fredericton and various Ontario centres.
- 1968 to 1970 Commonwealth Bureau of Roads, Melbourne, Australia. Working as a Principal Transport Planner on cost-benefit analyses of road needs, leading to recommendations on Federal Government Road Grants. Specifically concerned with traffic forecasts, construction and user costs for the 17 major cities, and large-scale national and regional traffic counting and transportation study techniques.
- 1963 to 1968 M. M. Dillon Limited, Consulting Engineers. Acted as Project Manager for transportation studies in Brampton, Leamington and Sudbury. Also responsible for traffic inputs to various functional planning and design projects.
- 1960 to 1963 City of Toronto Planning Board. Senior Planner (Projects) reporting on traffic and engineering aspects of planning district appraisals, the Toronto Downtown Plan and items referred by Public Works Committee, City Traffic Division and Metropolitan Departments.
- 1958 to 1960 Marshall Macklin Monaghan Limited, Consulting Engineers. Design and supervision experience on municipal projects and subdivision roads and services.
- 1956 to 1958 England. Working on various projects including water supply and structures for a consultant, and flood control for a River Board.

PAUL F. INGLIS



EDUCATION: B.Eng., McMaster University, 1970
M.Eng., McMaster University, 1971

SOCIETIES: Association of Professional Engineers of
Ontario

EXPERIENCE RECORD:

With De Leuw Cather since 1971

1971 to date London Office.

Project engineer on the Windsor Area Transportation Study. Responsibility included the development of modelling in the first phase using the "Simplified Procedure for Urban Transportation Planning".

Project engineer on the "Glebe Area Study" in Ottawa.

Project engineer in charge of the Traffic Operations Study for the "London Urban Transportation Study".

Project engineer for the "Downtown Windsor Traffic Operations Study."

Project engineer for a data collection study of the London area for a major commercial client.

Research engineer for development of the "Simplified Procedure".

1970 to 1971 Postgraduate studies for masters degree. Courses included: Transportation Analysis Methods; Transportation Systems Evaluation; Urban Planning Models.

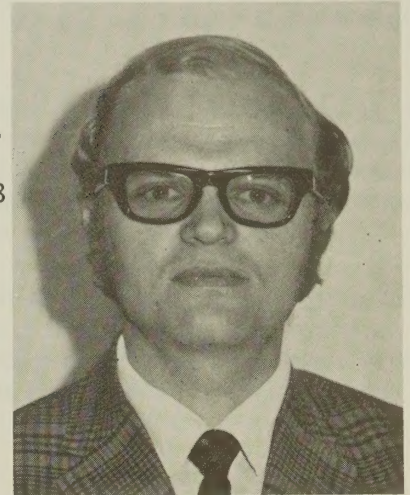
Thesis Topic: "Multimodal Logit Model of Modal Split for a Short Journey".

1967 to 1970 Federal Department of Public Works as a design engineer - pavement design, wharf design, parking lot layout.

Canadian National Railway - survey head for layout and realignment

Department of Highways of Ontario - survey and construction supervision technician.

REINER JAAKSON



EDUCATION: Ph.D., School of Urban and Regional Planning,
University of Waterloo, 1973.
M.Sc. (Planning), University of Toronto, 1968
Diploma, Urban and Regional Planning,
University of Toronto, 1965
B.A. (Geography), Sir George Williams
University, 1963

OFFICE: Principal, Ecologistics Limited
(an affiliate of De Leuw Cather)

SOCIETIES: Town Planning Institute of Canada
American Institute of Planners,
Associate Member
Community Planning Association of Canada

EXPERIENCE RECORD:

1972 to date Assistant Professor, Faculty of Forestry, University of Toronto.
Teaching Recreational and Land Use Planning.

1970 to 1972 Research consultant to the Department of Indian Affairs and Northern
Development (Canals Division) and the Ontario Ministry of Natural
Resources. Duties have involved a study of water resources and re-
creation on the Trent Canal reservoir lakes.

1966 to 1969 Supervisor, Land Use Division, Saskatchewan Water Resources Division,
Regina. Duties included supervision of a division involved in re-
gional planning, development control, coordination of the work of
several government interdepartmental committees and community work
with citizen groups and councils.

1965 Market location analyst with Gulf Oil Company Ltd.

1963 to 1964 Designer with Pacific Industries Ltd., Montreal, working on site and
industrial design.

PUBLICATIONS: Various papers on recreation, water resources and planning in
Canadian, British and American journals, including:

"Planning the capacity of lakes to accommodate water-oriented re-
creation," Plan Canada, Journal of the Town Planning Institute of
Canada, Vol. 10(3), 1970.

"Zoning to regulate on-water recreation," Land Economics, November
1971, Vol. XLVII, No. 4.

"Decentralized administration and citizen participation in community
planning," Long Range Planning, March 1972, Vol. 5(1).

"Factor analysis of shoreline physiography and attitudes of reser-
voir recreation users toward water level fluctuation," Water Resour-
ces Research, January 1973, Vol. 9(1).

LANDSCAPE ARCHITECT

Walter H. Kehm Project Planning Associates
Ltd.

Born 1937, New York, U.S.A.

Education New York State College of Forestry at
Syracuse University, 1955-1960, Bachelor of
Science in Landscape Architecture
Harvard University, 1960-1962, Master of
Landscape Architecture

Memberships Associate, American Society of Landscape
Architects
Member, Canadian Society of Landscape
Architects

Mr. Kehm is Chief Landscape Architect of Project Planning
Associates Limited responsible for this Department, which
undertakes regional studies, planning for recreation, studies in
urban landscape as well as design and execution of landscape
work.

Experience

1964 to date

As Chief Landscape Architect, Mr. Kehm has participated on
Landscape planning design projects throughout Canada, the
United States, Pakistan, the Caribbean and Europe. He is
concerned with the effects on the landscape as a result of
development and means to preserve ecological systems and
their intrinsic values. At the regional scale of landscape
analysis he has been involved with master plan studies for the
islands of St. Lucia, the Bahamas and Fiji.

A major aspect of his work is related to the evaluation and
planning of open space system. He has been the principal
landscape architect on the planning teams involved with the
Kanata, Meadowvale and Malvern new towns. Mr. Kehm
played a leading part in the development of the design of the
Meadowvale Street light as an element of the overall landscape
—streetscape design themes. On the Malvern community he
was involved with the planning and layout of open space and
recreation facilities from the community park level to detailed
design solutions for neighborhood open spaces.

Mr. Kehm was a participating member of the Environment and
Ecology Task Force of the Mid-Canada Development
Conference which studied the Canadian Boreal forest region
giving particular emphasis to the Mackenzie River Valley. The
findings of this Task Force were submitted to the Federal
Government of Canada.

As Regional Planner, he was the team member responsible for
preparing land analyses and evaluations for the regional
planning project for the Ottawa National Capital Region. He
prepared the regional land use plan related to agriculture,
forestry, wildlife, fishing and recreation.

As a Resource Planner, Mr. Kehm was responsible for the
preparation of landscape capability studies for a regional
planning project for the Dar es Salaam National Capital
Region, Tanzania.

For the Ontario Hydro Electric Commission he was
responsible for a landscape planning project which included
ecological analyses and evaluations to determine the impact of
the proposed generating plants on the natural environment,
i.e., oil, coal and nuclear powered generating stations.

For the Steel Company of Canada he was the principal
landscape architect responsible for the preparation of site
inventories and environmental impact implications of their
proposed 6000 acre steel making facility at Northside on Lake
Erie.

As Chief Landscape Architect of the firm Mr. Kehm has been
responsible for a regional landscape planning and construction
project for the implementation of the St. Lawrence Seaway
Authority's relocated Welland Canal. He has been responsible
for co-ordinating all planning and design aspects of this 10½
mile canal. Plans for grading 66 million cu. yd. of excavated
soil in order to create new potentially usable land areas have
been prepared followed by detailed landscape and planting
plans. This major land restoration project is presently under
construction.

He has participated as landscape co-ordinator for the
University of Guelph, where he was responsible for planning
and implementation of the \$200 million master plan. Detailed
designs have been implemented for fifteen buildings, major
roads and athletic facilities.

Mr. Kehm was responsible for a landscape study for Laval
University to preserve their existing trees and to determine
how landscape elements could be used to control climatic
condition (i.e., wind, snow). A series of physical studies were
made resulting in recommendations for tree location, species,
maintenance requirements and capital costs.

In addition, he has prepared plans for Cambrian College,
Carleton and Queen's Universities.

Present assignments are involved with community
participation projects to determine social and recreation needs
of low income neighbourhoods in Toronto, Guelph, and
Ottawa. A community development plan has been completed
for one of the largest housing projects in North America which
includes new concepts in playgrounds, after school programs,
family and health facilities and adult retraining. Parks and
recreation studies and the preparation of planning programs
have been completed for the new towns of Malvern and
Meadowvale in the Toronto Region.

Mr. Kehm has undertaken academic assignments such as
lecturing at Louisiana State University, Harvard University,
University of Guelph, and York University. In addition,
numerous public addresses have been given at conferences and
professional societies.

He has recently been Project Co-ordinator for the preparation of master plans and implementation drawings for Ontario Hydro's Pickering and Nanticoke electricity generating plants. Detailed landscape and ecology studies have been completed for each station.

1962-1964

Mr. Kehm spent two years of national service with the United States Army Corps of Engineers in Germany. He followed this break in his career to utilize the Weidenman Fellowship presented by the Harvard University School of Design for excellence in design. He travelled extensively in Italy, southern France and Spain to study the relationship of landscape to urban form and the detrimental effects on the environment as a result of over use of land and water resources.

1961-1962

Cambridge Planning Board, Cambridge, Massachusetts, Design Consultant.

Mr. Kehm was a team member on the design of several urban renewal and park projects.

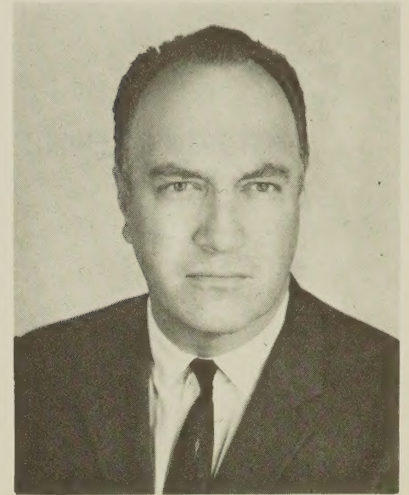
1960-1962

Moreice and Gary, Cambridge, Massachusetts, Landscape Architect. Design and execution of high school, housing and park landscape.

GEORGE W. KING

EDUCATION: University of New Brunswick, B.Sc.,
1950, Civil Engineering
University of Western Ontario, 1955
Business Administration
University of California, 1958
Fundamentals of Traffic Engineering

SOCIETIES: Association of Professional Engineers
of Ontario
Engineering Institute of Canada
Institute of Traffic Engineers
Registered Engineer, State of New
Mexico, U.S.A.



EXPERIENCE RECORD:

With De Leuw, Cather since 1964.

- 1971 to Date Toronto Office. Project Manager. Supervision of preliminary and final design for Highway 417 in Ottawa, Canada.
- 1969 to 1971 De Leuw, Cather International Inc., Taipei, Taiwan. Highway Engineer for feasibility and toll studies for the North-South Freeway Project, Taiwan. Supervised preparation of contract plans for freeway design near Taipei.
- 1968 to 1969 De Leuw, Cather International Inc., Seoul, Korea. Special Consultant to the Highway Department for the Ministry of Construction in South Korea.
- 1964 to 1968 Toronto Office. Highway Planning Engineer. Supervised functional design studies and reports for access controlled highways in Toronto, Niagara Falls and North Bay in Ontario; and Montreal, Quebec.
- 1958 to 1964 New Mexico State Highway Department. Assistant Traffic Engineer. Projects included supervision of access control studies; geometric design of interchanges, intersections, freeway and intersection capacity studies, at-grade urban expressways, rest areas, truck weigh stations and signing for various interstate and urban projects in New Mexico.
- 1957 to 1958 De Leuw, Cather & Company, San Francisco, California. Highway Designer. Projects included functional, preliminary and final design on Interstate Highways for Salt Lake City, Utah, and Las Vegas, Nevada.
- 1955 to 1957 Proctor and Redfern, Toronto, Canada. Municipal Engineer on designs for sewers, roads and watermains for various subdivisions in Scarborough.
- 1955 Department of Highways, London, Canada. Office Engineer. Standard reports and administrative assistance for District Engineer.
- 1951 to 1954 C.D. Howe Co. Ltd., Montreal, Quebec. Field Engineer. Projects included inspection and supervision of dock work in Seven Islands and a grain elevator in Halifax, Nova Scotia.



HATCH ASSOCIATES LTD.

TUNNEL CONSULTANT

T. M. NOSKIEWICZ, P.Eng.
M.A.S.C.E., F.I.C.E., M.I.C.E.
Vice-President

B.Sc.(Eng) Honours, University of London, 1952

Mr. Noskiewicz joined Hatch Associates Ltd. in 1957 and was made a Director and Vice-President in 1965. He is responsible for the appraisal and direction of all design engineering and project management.

He is also a Senior Vice-President of Transit & Tunnel Consultants, Inc., the firm's subsidiary in the United States, in a joint venture with Mott, Hay & Anderson, Consulting Engineers, of London, England.

Mr. Noskiewicz has been responsible for major projects for government and industrial clients. All aspects of rapid transit, tunnelling and underground construction have been his special field of interest. He has been in charge of all the firm's work on the Toronto Subway System. In addition, his expert knowledge has led to his being called as a special consultant on tunnel and rapid transit projects in Montreal, Washington D.C., New York and Milan, Italy. Major projects on which he is currently engaged include the Yonge Street Subway, Northern Extension, in Toronto and the Melbourne Underground Rail Loop.

During the war Mr. Noskiewicz was a member of the Polish Underground and was involved in the Warsaw Uprising of 1944. He was taken prisoner and escaped to Italy where he joined the 2nd Polish Corps of the British Eighth Army.

Following the war and graduation from the University of London, he was for six years with the London Transport Executive, and as Engineering Assistant, Executive Assistant to the Chief Engineer, and Resident Engineer, participated in the design and supervision of a number of important projects encompassing underground railway stations, a new line, main railway marshalling yards and maintenance facilities. During this period he was, for three years, a part-time lecturer in mathematics at Westminster Technical College.

Mr. Noskiewicz is a Member of the Engineering Institute of Canada, the Association of Consulting Engineers of Canada, the Institution of Civil Engineers and the American Society of Civil Engineers.

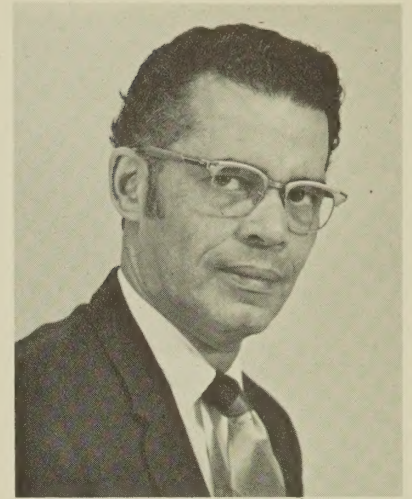
MONTY P. O'BRIEN

EDUCATION: Canadian Institute of Science & Technology, Civil Engineering, 1950
 Ryerson Institute of Technology, Toronto, Mathematics, 1962

EXPERIENCE

RECORD: With De Leuw, Cather since 1954.

1954 to Date Toronto Office. Project Manager of various projects including Chatham Parking Garage, Operations Building for London P.U.C., Hamilton Rapid Transit Study, structural computer applications involving analysis of 1,000,000 sq. ft. proposed Ontario Hydro head office building, 500 ft. Bell Telephone micro wave tower, and 57 storey Commerce Court office tower.



Assistant to head of structural department in Toronto office engaged in administration, supervision, and design on various structural projects including highway and railway bridges; bridge investigations and reports; wharf facilities; feasibility studies for international bridge crossings; study for construction of a 1000-ft. long tunnel under an operating runway at Toronto International Airport; design of a 3000-ft. elevated rapid transit structure in Chicago. Designer on numerous highway bridges; on preliminary designs and final designs for University Ave. Subway, Bloor-Danforth Subway; on preliminary designs and cost estimates for C.N.R. Toronto Belt Line (20 highway bridges and 20 railway bridges) on design of many of the first continuous post-tensioned concrete bridges done in North America; on preliminary and final design of several highway bridges on the Awash Tendaho Highway project in Ethiopia; on the design and field supervision of a parking deck over an open cut section of the Yonge St. Subway; a parking structure incorporated in the University Ave. Subway structure; surface parking lots for the Toronto Parking Authority.

1946 to 1954 Toronto Transit Commission (1949-1953). Designer and Draftsman on Yonge Street Subway structures including bridges, surface and underground subway stations, tunnel sections, and Davisville repair and maintenance shop buildings. Remaining period with various consulting engineers in Toronto.

1944 to 1946 Armed Forces Overseas. Forty-Eighth Highlanders Infantry Regiment. One year with Military Government in occupied Germany engaged in administration of local reconstruction works.

1942 to 1944 De Havilland Aircraft Ltd. Draftsman and Design Draftsman in Tool Design Department.

JAMES J. PARRACK



EDUCATION: B.A.Sc., (Toronto) 1953,
Civil Engineering

SOCIETIES: Association of Professional Engineers
of Ontario
Canadian Technical Asphalt Association

OFFICES: Associate, De Leuw Cather, Canada Ltd.

EXPERIENCE

RECORD: With De Leuw Cather since 1959.

1969 to Date Toronto Office. Assistant Manager, Toronto Operations.
Construction Engineer responsible for all phases of construction supervision.

1972 - Highway Design Engineer for 50 miles of Highway in Tanzania, East Africa - responsible for initial field survey, design and final contract drawings.

1959 to 1969 Toronto Office. Project Manager, responsible for the preparation of the functional report, planning and design for the \$100,000,000 extension to the Gardiner Expressway. Project Manager for the design and supervision of construction of the stations and parking facilities for the GO Train Commuter Service in Toronto, Ontario. Construction Engineer responsible for supervision of construction for all phases of construction including bridges, drainage, earth moving and highways.

Project Engineer, jointly responsible for design, plans specifications and supervision of construction of the Frederick G. Gardiner Expressway, Toronto.

1958 to 1959 Con Bridge Limited, General Contractors. Field Engineer on construction of approaches to Cornwall International Bridge, addition to Ivy Lea Bridge, several bridges on Highway 401, Port Hope District, and Estimator on several bridges and earth-moving contracts.

1953 to 1958 Standard Paving Limited. General Superintendent for municipal and highway projects, including street widening, bridges, earth moving, sewers, drains and paving.

Born 1945, Rapid City, South Dakota, U.S.A.

Education University of Nebraska
University of Nuevo Leon,
Monterey, Mexico
B.A. in Sociology and
Creative Writing

Experience

1971 to date

Mrs. Richards is Director of Sociological Programmes in Motivational Research for the Project Group of Companies in Interthink Limited. She works with the Urban and Environmental Planning Staff in developing sociological research programmes to augment Planning Development. In this capacity Mrs. Richards has been responsible for designing and managing such projects as:

A tourist development plan Study in Cobalt, Ontario, to determine local interest in tourist expansion;

An appraisal of user needs for the proposed Bronte Creek Provincial Park;

An analysis of the effectiveness of Parks Communications Systems in Fundy National Park;

An attitudinal survey of residents, industry and commerce in the Halton-Wentworth area to determine the recreational needs and wants of the Waterfront area.

As well, Mrs. Richards is involved in many areas of Consumer Related Research.

1969 to 1971

Mrs. Richards, as co-founder of Interthink Limited, was primarily responsible for the sales and managing study execution. She was involved in Social Planning and Consumer Research, for example:

Consumer awareness of the role of phosphate detergents in the pollution issue for the Electric Reduction Company of Canada Limited;

A promotional research programme for an oil company;

An extensive research programme for the Kendall Company (Canada) Limited involving Product Testing, New Product Development, and Marketing Campaign Effectiveness Evaluation.

After returning from the Orient in early 1968, Mrs. Richards joined the staff of the Rehabilitation Institute in Chicago. While there she developed a psycho/socio programme for social rehabilitation. The title of this work is "Intensive Inter-action in Social Re-Orientation". The work was co-authored with Dr. Bernard Levine, Chief Psychologist, Rehabilitation Institute, Chicago, Illinois, and has been used at the Rehabilitation Institute and the Houston Burn Centre. From the initial development of this programme, adaptations have been made and the design expanded to have industrial and planning value. This revised design method is entitled Intensive/Interaction Workshop Groups, and has been used by numerous companies including, Boeing Aircraft, Kendall Company and The Electric Reduction Company of Canada Limited for the development of marketing strategies and employee programmes.

While in Chicago Mrs. Richards designed and supervised studies in Public Housing programmes and Parks and Recreation Programmes on Land Use and Programme Development.

1965 to 1967

In 1965 Mrs. Richards became internal advertising editor for "Look" magazine. She was responsible for: development of creative concept for Cowles Communication advertising programmes and for development of studies to measure consumer response to publication content and advertising. In late 1965 she was assigned the task of developing the Cowles Advertising Campaign Approach for 1966. Her duties included examination and analysis of existing data related to consumer response on "Look" magazine and "Venture: A Traveler's World". In 1967 she requested and received an assignment to "New History Research", a joint publication venture designed to develop increased social science input related to current events. The main thrust of the programme was interviewing U.S. Armed Forces in the Orient on attitudes and experiences. She was based in Tokyo for eight months and traveled extensively through the Pacific Rim. She functioned as both research consultant and foreign correspondent. Material based on this work has been published in "Look", "Time", and "Life" magazines.

1964 to 1965

After completing undergraduate work at the University of Nebraska, Mrs. Richards joined the Staff of H.H. Harne Advertising. As senior copywriter and research group leader, her function was to co-ordinate marketing and motivational research programmes for the Firm's clients. Later that year she was to co-ordinate marketing and motivational research programmes for the firm's clients. Later that year she was engaged on a professional basis as survey co-ordinator for the Democratic Gubernatorial Campaign in Nebraska. Her responsibilities included attitude studies, public relations programming and media management for the campaign period.

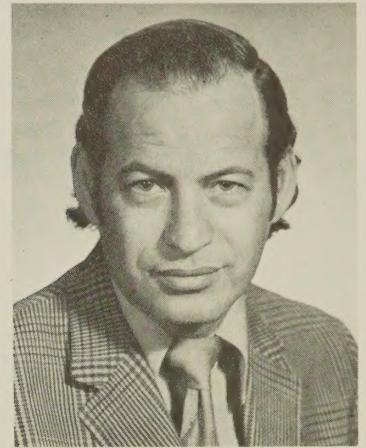
MORRIS ROTMAN

EDUCATION: University of Toronto, B.A.Sc., 1956
Postgraduate study in Detroit, 1967
and University of Toronto, 1971

SOCIETIES: Institute of Traffic Engineers
Association of Professional Engineers
of Ontario

EXPERIENCE

RECORD: With De Leuw Cather since 1972



- 1973 to Date Project Engineer responsible for collection of traffic, demographic and land use data throughout major urban centres in Canada for major oil company. Project Manager on Study of Effects of Enforcement on Traffic Violations for Ministry of Transport. Supervisor of M.O.T. study on relationship of traffic conflicts and accidents, undertaken at the University of Toronto.
- 1971 City of Haifa, Israel. Temporary assignment on design, layout and synchronization of traffic signals and accident studies.
- 1970 Metropolitan Toronto, Department of Roads and Traffic. Assistant to the Commissioner. Administrative duties and analysis of CBD transportation trends.
- 1968 to 1970 Israel Ministry of Transport. Senior Traffic Safety Engineer responsible for the engineering and research divisions of the Road Safety Authority.
- 1966 to 1968 Detroit Regional Transportation and Land Use Study. Responsible for highway facilities and traffic operations phases of this \$4 million study. Collected and analyzed all geometric, volume, speed and accident data on over 5,000 miles of arterial roads and highways in the 7-County Detroit region.
- 1963 to 1965 Israel Ministry of Transport. Traffic Safety Engineer. Evaluation of system for recording and analyzing country-wide accident data. Developed improvements to computer system allowing output of detailed accident data for every municipality in the country. Consultant to City of Haifa. Planning and design of intersection improvements and traffic signal installations. Recommended parking policy and transit improvements.
- 1962 to 1963 British Ministry of Transport, London Traffic Management Unit. Planning, design and execution of major traffic schemes to alleviate several of London's worst bottlenecks.
- 1961 to 1962 Damas & Smith Consulting Engineers, Toronto. Traffic Planning Engineer for City of Oshawa Transportation Study.
- 1957 to 1961 City of Toronto. Responsible for Analysis Section of Traffic Division. Work involved traffic analyses and forecasts, traffic signal design, and accident studies.

DR. G. J. THIESSEN

NATIONAL RESEARCH COUNCIL

NOISE CONSULTANT (ALT)

G.I. Thiessen has been involved with noise problems, in general, for 30 years and with noise in town and community planning for about 10 years. During this latter period he has been invited to lecture and help in preparing reports on this and related subjects on this continent and in Europe by the Acoustical Society of America, the Canadian Committee on Acoustics, the Department of Transport (U.S.A.), the Environmental Protection Agency (U.S.A.), the National Physical Laboratory (Great Britain), the Organization for Economic Cooperation and Development (Paris) and many universities. Assistance has been provided for CMHC (1961) regarding relocation of train tracks in Toronto and the effect on neighbouring housing developments, for Air Canada regarding the acceptability, at London Airport, of the DC-8 aircraft noise with different take-off procedures (1961). In 1959-1960 consulting services were rendered for the general preliminary planning of the Hilton Inn at Dorval Airport.

In 1971 Thiessen was the noise consultant for M.M. Dillon Ltd. in their Highway 417 Study which was made for the Regional Municipality of Ottawa-Carleton and then again in the 416 Study (1972-73, not yet completed). Many brief and ad hoc consultations involved noisy industries and their interactions with the community (e.g., sawmills, quarrying operations, etc.), railway humpyards, noise problems in apartment buildings after they had already been completed.

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